UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,096	11/26/2003	John E. Kendall	62806A (1062-023)	1111

25215 7590 01/08/2008

DOBRUSIN & THENNISCH PC
29 W LAWRENCE ST
SUITE 210
PONTIAC, MI 48342

EXAMINER	
HUSON, MONICA ANNE	
ART UNIT	**PAPER NUMBER**
1791	
MAIL DATE	**DELIVERY MODE**
01/08/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,096	KENDALL ET AL.	
	Examiner	Art Unit	
	Monica A. Huson	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24 and 26-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24 and 26-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the paper filed 23 October 2007.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24, 31-35, 38, and 40-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winckler et al. (U.S. Patent 4,620,047), in view of James 4,368,323).

Regarding Claim 24, Winckler et al., hereafter "Winckler," show that it is known to carry out a method of molding a sheet molding compound (Abstract) comprising combining a macrocyclic oligoester and a reactive compound with a transesterification catalyst thereby forming a reactive admixture wherein the reactive compound is selected from another macrocyclic oligoester or a secondary compound (Col 29 Line 55-64); combining the reactive admixture with a Linking agent and a reinforcement material to form the sheet molding compound (Col 10 Line 45-56); molding the sheet molding compound at an elevated temperature thereby forming a cross-linked matrix within the sheet molding compound (col 26 lines 3-10) wherein the macrocyclic oligoester reacts with the reactive compound in the presence of the transesterification catalyst to produce a block copolymer (col 30 lines 7-13); the linking agent couples chains of the block copolymer together thereby increasing the molecular weight of the block copolymer (Col 26 Line 3-10; it is interpreted that the surfactant acts as the linking agent). Winckler does not show one of the particularly claimed linking agents. James shows that it is known to carry out a method wherein a surfactant and a diepoxide work together, both functioning as known cross-linking agents (Column 1, lines 65-68; Column 2, lines 1-2). James and Winckler are combinable because they are concerned with a similar technical field, namely, methods of molding including wet slurry molding processes. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use James' diepoxide as the linking agent in Winckler's molding process in order to take advantage of its bridging and linking abilities (See James, Column 2, lines 1-2, 22-25).

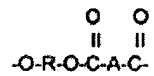
Regarding Claim 31, Winckler discloses combining a filler with the reactive admixture wherein the filler and the reinforcement material represent at least about 50% by weight of the sheet molding compound (Col 10 Line 57-60).

Regarding Claim 32, Winckler discloses blend material wherein the filler is calcium carbonate (Col 10 Line 48-50) and wherein the macrocyclic ester, the secondary compound or both are present in the sheet molding compound in an amount between about 1% and about 30% by weight (col 16 lines 50-51).

Regarding Claim 33, Winckler discloses applying the sheet molding compound to one or more plastic films, the plastic films being at least partially formed of a polyester resin wherein, upon molding, the sheet molding compound is integrated with the one or more plastic films in the one or more parts (Col 27 Line19-30).

Regarding Claim 34, Winckler discloses admixing into the molding compound, a low profile agent including a clay that is intercalated with a macrocyclic oligoester, wherein exfoliation of the clay during polymerization of the macrocyclic oligoester increases volume for offsetting shrinkage (Col 10 Line 52) and wherein step of molding the sheet molding compound wherein the molding step occurs in a time period selected from within 24 hours of forming the admixture or no less than 10 days after forming the admixture (Col 11 Line 58-62). Examiner notes that intercalation and exfoliation of the clay platelets in the polymer resin is inherently in Winckler's discussion of nanoclays increasing the modulus of the product. When the nanoclay is mixed/blended into the molding compound, the clays platelets will inherently be intercalated/exfoliated with the macrocyclic oligoester. As further support, it is well established in the field of nanocomposites that adding nanoclays and exfoliating the individual clay platelets will improve the material properties of a polymer such as the modulus.

Regarding Claim 35, Winckler discloses a macrocyclic oligoester wherein the structural repeat unit of formula is as follows:



wherein R is an alkylene, a cycloalkylene, or a mono- or polyoxyalkylene group, and A is a divalent aromatic or alicyclic group (Col 12 Line 59-64).

Regarding Claim 38, Winckler shows that it is known to carry out a method of molding a sheet molding compound (Abstract) comprising combining a macrocyclic oligoester, a cyclic butylenes terephthalate, and a reactive compound with a transesterification catalyst thereby forming a reactive admixture wherein the reactive compound is selected from another macrocyclic oligoester or a secondary compound (Col 29 Line 55-64); combining the reactive

admixture with a Linking agent and a reinforcement material to form the sheet molding compound (Col 10 Line 45-56; Column 29, lines 57-64); molding the sheet molding compound at an elevated temperature thereby forming a cross-linked matrix within the sheet molding compound (col 26 lines 3-10) wherein the macrocyclic oligoester reacts with the reactive compound in the presence of the transesterification catalyst to produce a block copolymer (col 30 lines 7-13); the linking agent couples chains of the block copolymer together thereby increasing the molecular weight of the block copolymer (Col 26 Line 3-10; it is interpreted that the surfactant acts as the linking agent). Winckler does not show one of the particularly claimed linking agents. James shows that it is known to carry out a method wherein a surfactant and a diepoxide work together, both functioning as cross-linking agents (Column 1, lines 65-68; Column 2, lines 1-2). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use James' diepoxide as the linking agent in Winckler's molding process in order to take advantage of its bridging and linking abilities (See James, Column 2, lines 1-2, 22-25).

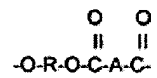
Regarding Claim 40, Winckler discloses combining a filler with the reactive admixture wherein the filler and the reinforcement material represent at least about 50% by weight of the sheet molding compound, wherein the filler is calcium carbonate (Col 10 Line 57-62), and wherein the macrocyclic ester, the secondary compound or both are present in the sheet molding compound in an amount between about 1% and about 30% by weight (col 16 lines 50-51).

Regarding Claim 41, Winckler discloses applying the sheet molding compound to one or more plastic films, the plastic films being at least partially formed of a polyester resin wherein, upon molding, the sheet molding compound is integrated with the one or more plastic films in the one or more parts (Col 27 Line19-30).

Regarding Claim 42, Winckler discloses admixing into the molding compound, a low profile agent including a clay that is intercalated with a macrocyclic oligoester, wherein exfoliation of the clay during polymerization of the macrocyclic oligoester increases volume for offsetting shrinkage (Col 10 Line 52). Examiner notes that intercalation and exfoliation of the clay platelets in the polymer resin is inherently in Winckler's discussion of nanoclays increasing the modulus of the product. When the nanoclay is mixed/blended into the molding compound, the clays platelets will inherently be intercalated/exfoliated with the macrocyclic oligoester. As further support, it is well established in the field of nanocomposites that adding nanoclays and exfoliating the individual clay platelets will improve the material properties of a polymer such as the modulus.

Regarding Claim 43, Winckler discloses admixing into the molding compound, a low profile agent including a step of molding the sheet molding compound wherein the molding step occurs in a time period selected from within 24 hours of forming the admixture or no less than 10 days after forming the admixture (Col 11 Line 58-62).

Regarding Claim 44, Winckler discloses a macrocyclic oligoester wherein the structural repeat unit of formula is as follows:



wherein R is an alkylene, a cycloalkylene, or a mono- or polyoxyalkylene group, and A is a divalent aromatic or alicyclic group (Col 12 Line 59-64).

Claims 26, 28, 39, and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winckler, Jamer, further in view of Wang (U.S. Patent 6,436,549).

Regarding Claim 26, Winckler shows the process as claimed as discussed in the rejection of Claim 24 above, but he does not specifically use a dihydroxl functionalized macrocyclic oligoester having a particular molecular weight. Wang shows that it is known to carry out a method of molding wherein the macrocyclic oligoeseter is dihydroxyl functionalized and has a molecular weight of between 500 and 100,000 (Column 7, lines 3-6). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Wang's particular macrocyclic oligoester during Winckler's molding process in order to take advantage of the excellent bond structure of the resulting matrix and final article.

Regarding Claim 28, Winckler shows the process as claimed as discussed in the rejection of Claim 24 above, including showing that the reactive compound is a secondary compound, but he does not show using block copolymers. Wang shows that it is known to carry out a method wherein the polymer chains are block copolymers (Column 3, lines 53-59). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Wang's block copolymers during Winckler's molding process in order to take advantage of their bonding structure and varying functionality, based on their varying structural makeup.

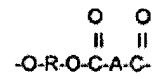
Regarding Claim 39, Winckler shows the process as claimed as discussed in the rejection of Claim 38 above, including showing that the reactive compound is a secondary compound, but he does not show using block copolymers. Wang shows that it is known to carry out a method wherein the polymer chains are block copolymers (Column 3, lines 53-59). It would have been prima facie obvious to one of ordinary skill in the art at the time the

invention was made to use Wang's block copolymers during Winckler's molding process in order to take advantage of their bonding structure and varying functionality, based on their varying structural makeup.

Regarding Claim 45, Winckler shows that it is known to carry out a method of molding a sheet molding compound (Abstract) comprising combining a macrocyclic oligoester, a cyclic butylenes terephthalate, and a reactive compound with a transesterification catalyst thereby forming a reactive admixture wherein the reactive compound is selected from another macrocyclic oligoester or a secondary compound (Col 29 Line 55-64); combining the reactive admixture with a Linking agent and a reinforcement material to form the sheet molding compound (Col 10 Line 45-56; Column 29, lines 57-64), combining a filler with the reactive admixture wherein the filler and the reinforcement material represent at least about 50% by weight of the sheet molding compound, wherein the filler is calcium carbonate (Col 10 Line 57-62), and wherein the macrocyclic ester, the secondary compound or both are present in the sheet molding compound in an amount between about 1% and about 30% by weight (col 16 lines 50-51); molding the sheet molding compound at an elevated temperature thereby forming a cross-linked matrix within the sheet molding compound (col 26 lines 3-10) wherein the macrocyclic oligoester reacts with the reactive compound in the presence of the transesterification catalyst to produce a block copolymer (col 30 lines 7-13); the linking agent couples chains of the block copolymer together thereby increasing the molecular weight of the block copolymer (Col 26 Line 3-10; it is interpreted that the surfactant acts as the linking agent). Winckler does not show one of the particularly claimed linking agents. James shows that it is known to carry out a method wherein a surfactant and a diepoxide work together, both functioning as cross-linking agents (Column 1, lines 65-68; Column 2, lines 1-2). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use James' diepoxide as the linking agent in Winckler's molding process in order to take advantage of its bridging and linking abilities (See James, Column 2, lines 1-2, 22-25). Winckler also does not specifically use a macrocyclic oligoester having a particular molecular weight. Wang shows that it is known to carry out a method of molding wherein the macrocyclic oligoeseter is dihydroxyl functionalized and has a molecular weight of between 500 and 100,000 (Column 7, lines 3-6). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Wang's particular macrocyclic oligoester during Winckler's molding process in order to take advantage of the excellent bond structure of the resulting matrix and final article.

Regarding Claim 46, Winckler shows the process as claimed as discussed in the rejection of Claim 45 above, including a method including applying the sheet molding compound to one or

more plastic films, the plastic films being at least partially formed of a polyester resin wherein, upon molding, the sheet molding compound is integrated with the one or more plastic films in the one or more parts (Col 27 Line19-30), admixing into the molding compound, a low profile agent including a clay that is intercalated with a macrocyclic oligoester, wherein exfoliation of the clay during polymerization of the macrocyclic oligoester increases volume for offsetting shrinkage (Col 10 Line 52) and wherein step of molding the sheet molding compound wherein the molding step occurs in a time period selected from within 24 hours of forming the admixture or no less than 10 days after forming the admixture (Col 11 Line 58-62), wherein the structural repeat unit of formula is as follows:



wherein R is an alkylene, a cycloalkylene, or a mono- or polyoxyalkylene group, and A is a divalent aromatic or alicyclic group (Col 12 Line 59-64), meeting applicant's claim.

Claims 27, 30, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winckler and James, further in view of Tikart et al (US 2002/0082350).

Regarding Claims 27 and 36, Winckler discloses that the reinforcement material includes glass fibers (col 14 lines 5-10), the sheet molding compound includes at least 40% filler, which includes calcium carbonate, glass microspheres or both (col 10 lines 45-65), the reactive admixture includes an unsaturated polyester; and the macrocyclic oligoester includes polybutylene terephthalate (col 29 lines 57-64) but does not teach that the reactive admixture includes a styrene monomer. Nevertheless, Tikart teaches using styrene as a cross-linking agent (Pg 1 Par 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Tikart's teaching of using styrene as a cross-linking agent in Winckler's molding compound in order to enhance the thermal and electrical properties of the resin (Pg 1 Par 14).

Regarding Claim 30, Winckler teaches everything previously mentioned above in the 102(e) rejection. Winckler, however, does not teach linking agent that is reactive monomer selected from a styrene, a methyl methacrylate or a peroxide. Nevertheless, Tikart teaches using styrene as a cross-linking agent (Pg 1 Par 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Tikart's teaching of using styrene as a cross-linking agent in Winckler's molding compound in order to enhance the thermal and electrical properties of the resin (Pg 1 Par 14).

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Winckler and James, further in view of Ladang et al. (US 2002/0153633). Winckler teaches everything previously mentioned above in the 102(e) rejection. Winckler, however, does not teach end-capped saturated polyester selected from a polycaprolactone terminated by a phenyl isocyanate and a diethylene glycol adipate polyol terminated by phenyl isocyanate for assisting in maintaining greater dimensional stability. Nevertheless, Ladang teaches terminating polycaprolactone by phenyl isocyanate (Pg 7 Claim 8). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use Ladang's teaching of terminating polycaprolactone by phenyl isocyanate in Winckler's molding compound in order to increase the rate of self-crosslinking in the presence of water (Pg 3 Par 35).

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Winckler and James, further in view of Rayfield et al. (U.S. Patent 4,898,620). Winckler shows the process as claimed as discussed in the rejection of Claim 24 above, but he does not show a thermosetting resin in his reactive mixture. Rayfield et al., hereafter "Rayfield," show that it is known to carry out a method wherein a thermosetting resin is included in the reactive molding mixture (Column 5, lines 40-51; Column 9, lines 6-11). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Rayfield's thermosetting resin in Winckler's reactive mix in order to bolster the strength and heartiness of the final molded article.

Response to Arguments

Applicant's arguments filed 23 October 2007 have been fully considered but they are not persuasive.

Applicant contends that Winckler does not show forming a cross linked maxtrix within the sheet molding compound; applicant incorporates arguments previously filed on this subject. These arguments are not persuasive for the reasons discussed in the paper mailed 1 September 2006.

Applicant contends that Winckler and James are not properly combinable. This is not persuasive because James clearly discusses the wet slurry composition and the products made (e.g. molded) therefrom at Column 1, lines 10-30, 42-56). Further, it is noted that although James primarily discusses the use of a wood pulp slurry, he also discusses the use of a synthetic (i.e. polymeric) pulp slurry at Column 5, lines 1-14. Therefore, it is clearly contemplated by James that adding the surfactant to plastics pulp material is known and beneficial.

Applicant contends that there is no expectation of success when combining James and Winckler. This is not persuasive because James was cited to show that a surfactant can be a cross linking agent (as is implied by Winckler) and also to show a specifically claimed linking agent. James indicates that the two work as linking agents, thereby establishing a functional equivalence. Therefore, since Winckler already teaches the use of a surfactant (i.e. linking agent), the use of James' specific linking agent would have a clear reasonable expectation of success.

Applicant contends that Winckler teaches away from the formation of a cross-linked matrix. This is not persuasive as discussed above and in the paper mailed 1 September 2006.

Applicant contends that the motivation to combine James with Winckler is flawed because there is no indication that Winckler desires bridging and linking in his material. This is not persuasive because, as discussed above, Winckler teaches using a surfactant and implies that it is a cross linking agent. Therefore, it is clear that he desires some appreciable degree of linking and bridging. James identifies that surfactants act as linking agents and teaches a specifically-claimed linking agent. As noted above, since Winckler already teaches the use of a surfactant (i.e. linking agent), the use of James' specific linking agent would have a clear reasonable expectation of success and would also provide the desired linking and bridging in Winckler's material.

Applicant contends that none of the prior art show advantageous traits of the claimed cross-linked matrix. This is not persuasive as higher temperature performance and desirable strength properties are only intended results of the claimed invention and not positively-claimed method steps.

Regarding Claim 32, 42, and 46, applicant contends that intercalation and exfoliation are not inherent properties to clay. Applicant goes on to say "Clays can be included in a plastic for a variety of reasons and can provide various properties." This is not persuasive because applicant has not shown any reason that intercalation and exfoliation are not considered inherent properties of clay, nor has applicant addressed the fact that adding nanoclays and exfoliating the individual clay platelets is known to improve the material properties of a polymer such as the modulus. It is noted that "to offset shrinkage" is only an intended result of the claimed invention and not a positively-claimed method step.

Regarding Claim 37, applicant contends that it would not have been obvious to combine Rayfield's thermosetting resin in Winckler's process because Winckler would not desire a strong final material. This is not persuasive because Winkler would have still valued the strength that Rayfield's thermosetting resin provides even in his primarily thermoplastic composition.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A. Huson whose telephone number is 571-272-1198. The examiner can normally be reached on Monday-Friday 7:00am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Monica A Huson

Monica A Huson

December 28, 2007